EU study on Radiation Protection Education and Training

MEDRAPET

An Overview of an European Commission DG ENER Project

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WP1 leader

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Article 7

Training

1. Member States shall ensure that practitioners and those individuals mentioned in Articles 5 (3) and 6 (3) have adequate theoretical and practical training for the purpose of radiological practices, as well as relevant competence in radiation protection.

For this purpose Member States shall ensure that appropriate curricula are established and shall recognize the corresponding diplomas, certificates or formal qualifications.

2. Individuals undergoing relevant training programmes may participate in practical aspects for the procedures mentioned in Article 5 (3).

3. Member States shall ensure that continuing education and training after qualification is provided and, in the special case of the clinical use of new techniques, the organization of training related to these techniques and the relevant radiation protection requirements.

4. Member States shall encourage the introduction of a course on radiation protection in the basic curriculum of medical and dental schools.

Article 9

Special Practices

1. Member States shall ensure that appropriate radiological equipment, practical techniques and ancillary equipment are used for the medical exposure

- of children,

- as part of a health screening programme,

- involving high doses to the patient, such as interventional radiology, computed tomography or radiotherapy.

Special attention shall be given to the quality assurance programmes, including quality control measures and patient dose or administered activity assessment, as mentioned in Article 8, for these practices.

2. Member States shall ensure that practitioners and those individuals referred to in Article 5 (3) performing the exposure referred to in the first paragraph obtain appropriate training on these radiological practices as required by Article 7 (1) and (2).
THE TARGET

Radiation Protection Authorities

Professional Societies

Educational Institutions

WP1
Countries to pilot questionnaire
Communication strategy

Survey pre-announcement

Link to survey send by email to 1023 contact database (announcing 29\textsuperscript{st} of September as the deadline for response)

Send reminders for non responders on the 22/09; 27/09; 29/09; 4/10; 6/10; 11/10; 13/10; 18/10; 20/10
**Survey response rate**

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<th>Answers</th>
<th>Response rate (%)</th>
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**Note:** updated data including latest replies from 4 RPA (March 2013)

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**Survey response rate**

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<td>Federal Agency for Nuclear Control</td>
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<td>Portugal</td>
<td>Center for Nuclear Physics, University of Lisbon</td>
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</table>
Radiation Protection Authorities

Is education and training in radiation protection, for students/residents a legal requirement in your country?

- Medical Students: 46% no, 54% yes
- Radiographer students: 46% no, 54% yes
- Medical Physics students: 46% no, 54% yes
- Medical dentists students: 46% no, 54% yes
- Nurse students: 46% no, 54% yes
- Radiology residents: 46% no, 54% yes
- Oncology residents: 46% no, 54% yes
- Nuclear medicine residents: 46% no, 54% yes
Does your country ensure that health professionals have adequate theoretical knowledge on RP?

- Radiologists: 30% yes, 70% no
- Radiographers: 30% yes, 70% no
- Medical physicists: 30% yes, 70% no
- Dentists: 30% yes, 70% no
- Nurses: 30% yes, 70% no
- Radiation oncologists: 30% yes, 70% no
- Nuclear medicine specialists: 30% yes, 70% no
- Intervventional Radiologists: 30% yes, 70% no
- Intervventional Cardiologists: 30% yes, 70% no
- Gastroenterologists: 30% yes, 70% no
- Vascular surgeons: 30% yes, 70% no
- Orthopedic Surgeons: 30% yes, 70% no
- Urologists: 30% yes, 70% no
- Neurosurgeons: 30% yes, 70% no
- Pediatrics: 30% yes, 70% no
- General Practitioners: 30% yes, 70% no
- Emergency doctors: 30% yes, 70% no
Does your country ensure that health professional have adequate practical training on RP?

- Radiologists: 53% no, 47% yes
- Radiographers: 53% no, 47% yes
- Medical physicists: 53% no, 47% yes
- Dentists: 53% no, 47% yes
- Nurses: 53% no, 47% yes
- Radiation oncologists: 53% no, 47% yes
- Nuclear medicine specialists: 53% no, 47% yes
- Interventional Radiologists: 53% no, 47% yes
- Interventional Cardiologists: 53% no, 47% yes
- Gastroenterologists: 53% no, 47% yes
- Vascular surgeons: 53% no, 47% yes
- Orthopedic Surgeons: 53% no, 47% yes
- Urologists: 53% no, 47% yes
- Neurosurgeons: 53% no, 47% yes
- Pediatrics: 53% no, 47% yes
- General Practitioners: 53% no, 47% yes
- Emergency doctors: 53% no, 47% yes

Red: no (53%)
Green: yes (47%)
Radiation Protection Authorities

Does your country ensure that health professionals involved in special practices that deliver higher dose to the patient obtain specific training on RP for those practices?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Radiologists
Radiographers
Medical physicists
Dentists
Nurses
Radiation oncologists
Nuclear medicine specialists
Interventional Radiologists
Interventional Cardiologists
Gastroenterologists
Vascular surgeons
Orthopedic Surgeons
Urologists
Neurosurgeons
Pediatrics
General Practitioners
emergency doctors

- no (60%)
- yes (40%)
Does your country encourage the introduction of a course of RP in basic curriculum for health professions?

- **Radiologists**
- **Radiographers**
- **Medical physicists**
- **Dentists**
- **Nurses**
- **Radiation oncologists**
- **Nuclear medicine specialists**
- **Interventional Radiologists**
- **Interventional Cardiologists**
- **Gastroenterologists**
- **Vascular surgeons**
- **Orthopedic Surgeons**
- **Urologists**
- **Neurosurgeons**
- **Pediatrics**
- **General Practitioners**
- **Emergency doctors**

Red: no (50%)
Green: yes (50%)
Is there a mechanism, in your own country, to ensure that continuous E&T in RP for health professions is provided?

- Radiologists
- Radiographers
- Medical physicists
- Dentists
- Nurses
- Radiation oncologists
- Nuclear medicine specialists
- Interventional Radiologists
- Interventional Cardiologists
- Gastroenterologists
- Vascular surgeons
- Orthopedic Surgeons
- Urologists
- Neurosurgeons
- Pediatrics
- General Practitioners
- Emergency doctors

Red (65%) = No
Green (35%) = Yes
Radiation Protection Authorities

Does the website of your institution provide educational material focused on RP for health professionals?

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<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
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<th>70%</th>
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- no (79%)
- yes (21%)
Radiation Protection Authorities

Please indicate your estimation of which of the following constitute a barrier to continuing RP E&T for health professionals (excluding students) in your country:

- Lack of regulatory framework
- Lack of interest/action by professional/scientific societies
- Lack of interest/action by health authorities
- Lack of interest/action by RP authorities
- Lack of interest/action by holder of radiological installation
- Lack of interest/awareness by trainees
- Lack of financial resources
- Lack of suitable trainers

![Bar Chart]

- Green: no barrier
- L2B
- L3B
- L4B
- Major Barrier
Professional Societies

Percentage of ICRP+MEDRAPET topics included in the curriculum?
Conclusions of WP1

The survey, developed by the WP1 consortium, was targeted at the main stakeholders in European countries, with responsibility for ensuring the application of the MED, particularly in relation to Articles 7 and 9.

As expected by MEDRAPET consortium members, RP E&T are far from being harmonised, and in some instances have not even been implemented in EU countries, despite MED Directive requirements.

The questions put to RPAs were focused on obtaining information on the specific points in Article 7 of MED.

WP1 members had expected a more favourable response from RPAs. However, it is a matter of concern and disappointment to see the poor level of implementation of RP E&T at national level.
Conclusions of WP1 (cont)

The results obtained from RPAs could and should be used by national stakeholders to enforce the development of a strategy to focus on RP E&T.

The regulatory authorities and professional societies need to urgently take note of the findings of this survey to raise the profile of RP and ensure there are adequate resources for RP in their respective countries.

An overview of the results from the survey of key stakeholders, presents a clear message that there is an urgent need to build a bridge between RPAs, PS and EIs, in order to achieve the goals of the MED Directive.

Creating legislation and providing guidelines at EU or national level is, by itself, not enough to create a radiation protection safety culture amongst health professionals.

Regarding radiation protection issues, EU legislation should change their approach from encouraging to enforcing.

A centralised communication strategy developed between stakeholders at the EU level is necessary. The MEDRAPET consortium could, potentially, lead this challenging process.
A special thanks to the team

April 2012

WP1 lead
European Federation of Radiographer Societies, EFRS

Main Author
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EFRS Sija Geers van Gemeren
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WP1 support
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ESR Monika Hierath

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WP2 (Workshop, leader: ESR, Prof. J. Damilakis)

Objective:
To organize a workshop to discuss the results of the study performed in WP1. This workshop provided input for the drafting of the European Guidance document (WP3).

Main Tasks:

a) Administrative setting up of the workshop

b) Set up of the program

c) Prepare proceedings of the workshop
WP2: Workshop, Athens
April 21-23, 2012
108 participants from 29 countries
Workshop, Athens
Conclusions

• There is a need for implementation of the MED’s requirements on radiation protection education and training of medical professionals in many states of the European Union.

• Interventional radiologists require only second level training, while other interventionalists require both basic and dedicated second level training.
• All professional societies have some kind of RP E&T program. However, the majority of educational activities are carried out at undergraduate level or during residency. An effort should be made to increase CPD courses in RP E&T for all professions and specialities.

• A European body for accreditation in medical RP is needed to promote radiation protection by evaluating and accrediting graduate, residency and CPD courses focused on medical radiation.
Work Package 3
Objectives and Tasks

WP3 (leader: EFOMP, Dr. S. Christofides)

Objective:

The development of European Guidance on RP training of medical professionals containing appropriate recommendations on harmonisation in this field.

Main Tasks:

a) Define the methodological approach and structure of the Guidance

b) Define the content of the document
Final result

Radiation Protection 116

2000

Guidelines on education and training in radiation protection for medical exposures

European Commission

Radiation Protection N°175

2013?

Guidelines on radiation protection education and training of medical professionals in the European Union

European Commission
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      1.3 Role of organisations
      1.4 Disciplines not covered
      1.5 Healthcare professional schools
      1.6 The structure of the guidelines
   References
   2. Core learning outcomes for radiation protection
   References
   3. Learning outcomes for referrers
      3.1 Radiation protection professional entry requirements
      3.2 Continuous professional development in radiation protection
   References
   4. Learning outcomes for physicians directly involved with the use of ionising radiation
   References
      4.1 Diagnostic radiologists
         4.1.1 Radiation protection professional entry requirements
         4.1.2 Continuous professional development in radiation protection
         References
      4.2 Interventional radiologists
         4.2.1 Radiation protection professional entry requirements
         4.2.2 Continuous professional development in radiation protection
         References
      4.3 Non-radiological specialists employing ionising radiation in interventional techniques
         4.3.1 Radiation protection professional entry requirements
         4.3.2 Continuous professional development in radiation protection
         References
      4.4 Nuclear medicine specialists
         4.4.1 Radiation protection professional entry requirements
         4.4.2 Continuous professional development in radiation protection
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      4.5 Radiation oncologists
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         4.5.2 Continuous professional development in radiation protection
         References
   References
   5. Learning outcomes for dentists/dental surgeons
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      5.2 Continuous professional development in radiation protection
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   6. Learning outcomes for radiographers
      6.1 Radiation protection professional entry requirements
      6.2 Continuous professional development in radiation protection
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   7. Learning outcomes for medical physicists/medical physics experts
      7.1 Radiation protection professional entry requirements
      7.2 Continuous professional development in radiation protection
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   8. Learning outcomes for nurses and other healthcare workers not directly involved in the use of ionising radiation
      8.1 Radiation protection professional entry requirements
      8.2 Continuous professional development in radiation protection
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   9. Learning outcomes for maintenance engineers and maintenance technicians in radiation protection
      9.1 Radiation protection professional entry requirements
      9.2 Continuous professional development in radiation protection
   References
   10. Accreditation, certification and recognition of medical education and training in radiation protection
   References
      Appendix: Syllabus and ECTS model for radiation protection education and training
         Introduction
         ECTS for education and training
         ECTS for continuous professional development
   References
   11. Education and training resources
   Abbreviations
   Acknowledgements
   Annex: ICRP 113 tables 3.1 and 3.2

Final result
Table 6.1 - Specific learning outcomes for Radiation Protection at entry level

<table>
<thead>
<tr>
<th>Knowledge (facts, principles, theories, practices)</th>
<th>Skills (cognitive and practical)</th>
<th>Competence (responsibility and autonomy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1. Explain physical principles of radiation generation, interaction, modification and protection;</td>
<td>S1. Use the appropriate medical devices in an effective, safe and efficient manner;</td>
<td>C1. Practise effectively, accurately and safely and within the guidance of legal, ethical and professional frameworks;</td>
</tr>
<tr>
<td>K2. Explain radiation physics, radiation hazards, radiation biology and dosimetry;</td>
<td>S2. Use effective, safe and efficient radiation protection methods in relation to staff, patients and the general public applying current safety standards, legislation, guidelines and regulations;</td>
<td>C2. Use appropriate and correct identification, address and treatment of the patient (and any accompanying carer if appropriate);</td>
</tr>
<tr>
<td>K3. Understand risk: benefit philosophy and principles involved in all aspects of radiography;</td>
<td>S3. Critically review the justification of a given procedure and verify it in the light of appropriateness guidelines and in case of doubt consult the responsible specialist;</td>
<td>C3. Avoid unnecessary exposures and minimise necessary exposures as part of optimisation;</td>
</tr>
<tr>
<td>K4. Identify current national and international radiation protection legislation and regulations relating to staff, patients, carers and the wider general public;</td>
<td>S4. Use and undertake clinical audits;</td>
<td>C4. Seek consent for any examination/treatment to proceed;</td>
</tr>
<tr>
<td>K5. Explain physics underpinning non-ionising imaging techniques including magnetic resonance imaging and ultrasound along with associated safety considerations;</td>
<td>S5. Identify the principles of evidence-based practice and the research process;</td>
<td>C5. Carry out work in a safe manner when using ionising radiation, taking into account current safety standards, guidelines and regulations;</td>
</tr>
<tr>
<td>K6. Describe professional roles and responsibilities in terms of aspects of justification and optimisation;</td>
<td>S6. Critically reflect on and evaluate his/her own experience and practice;</td>
<td>C6. Participate in the process of creating and guaranteeing maximum safety for the patient, oneself and others during examinations/treatments involving ionising radiation and maintain the ALARA principle;</td>
</tr>
<tr>
<td>K7. Explain QA and QC practices to include: legislation, regulations and guidelines, test equipment and methodologies, programme design and implementation and reporting to thus ensure the provision of an effective, safe and efficient service;</td>
<td>S7. Participate in CPD;</td>
<td>C7. Refuse to accept or carry out a request or referral which, in his/her professional opinion, is dangerous or inadvisable;</td>
</tr>
<tr>
<td>K8. Understand occupational risks, health and safety that may be encountered such as safe moving and handling of patients and equipment;</td>
<td>S8. Recognize the complicated situation pertaining to radiation protection regarding scientific knowledge on the one side and societal concern and personal emotions on the other side;</td>
<td>C8. Recognise the limitations to his/her scope of competence and seek advice and guidance accordingly;</td>
</tr>
<tr>
<td>K9. Describe the importance of audit, research and evidence-based practice to include: the stages in the research process, research governance, ethics, statistics and statistical analysis to facilitate a deeper understanding of research findings and clinical audit;</td>
<td>S9. Identify different image quality standards for different techniques;</td>
<td>C9. When taking decisions about care for (individual) patients be able to make use of relevant national and international (scientific) insights, theories, concepts and research results and integrates these approaches in one's own professional actions (evidence-based practice);</td>
</tr>
<tr>
<td>K10. Identify the different determinants of radiation risk perception; know the pit-falls of communication on radiation risks.</td>
<td>S10. Apply the concepts and tools for radiation protection optimisation.</td>
<td></td>
</tr>
</tbody>
</table>
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